

Appin No. 09/575,171
Amdt. March 17, 2004
Response to Advisory action of February 19, 2004

2

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method of enabling user interaction with computer software running in a computer system via:

an interface surface displaying information relating to the computer software including a visible signature region corresponding to a signature field relating to the computer software, the interface surface having coded data disposed thereon both inside and outside the signature region, wherein all of the coded data is indicative of its own position relative to the interface surface and wherein the coded data located inside the signature region is further indicative of the signature field; and

a sensing device which, when placed in an operative position relative to the interface surface, senses at least some of the coded data and generates indicating data indicative of the signature field using at least some of the sensed coded data, and generates movement data indicative of the sensing device's movement;

the method including the steps of, in the computer system:

- (a) receiving the indicating data from the sensing device;
- (b) receiving the movement data from the sensing device;
- (c) identifying the signature field on the basis of the indicating data;
- (d) generating, in the computer system and using a signature key of the user that is a private key, a digital signature of digital content related to the computer software; and
- ([[d]]e) operating the computer software at least partly in reliance on the movement data, and in accordance with instructions associated with the signature field.

2. (Original) A method according to claim 1, including the step of verifying that the movement data represents a handwritten signature of the user.

3. (Original) A method according to claim 2, including the step of identifying the user.

4. (Original) A method according to claim 3, wherein the step of identifying the user includes using the movement data.

Appln No. 09/575,171

Amdt. March 17, 2004

Response to Advisory action of February 19, 2004

3

5. (Original) A method according to claim 3, further including the step of receiving, in the computer system, data indicative of the identity of the user.
6. (Original) A method according to claim 3, further including the step of receiving, in the computer system, data from storage means of the sensing device, the data being indicative of the identity of the user.
7. (Cancelled)
8. (Currently amended) A method according to claim ~~[[7]]~~1, further including the steps of generating a fixed length hash based on the digital content and encrypting the hash in accordance with the signature key after the signature has been verified, thereby generating the digital signature.
9. (Original) A method according to claim 8, wherein the digital content is provided by the user.
10. (Original) A method according to claim 9, wherein the digital content is based on data input by the user via the sensing device and interface surface.
11. (Currently amended) A method according to claim ~~[[7]]~~1, further including the step of associating, in the computer system, the digital signature with the signature field.
12. (Original) A method according to any one of claims 1 to 6, including the step of sending, in the computer system, data to the computer software indicative of at least the signature field.
13. (Original) A method according to any one of claims 1 to 6, wherein the signature field is associated with a visible signature zone defined on the interface surface.
14. (Original) A method according to any one of claims 1 to 6, wherein the sensing device includes at least one acceleration measuring device for measuring acceleration of the sensing device as it is used to sign the signature onto the surface, the movement data being generated by periodically sampling the acceleration of the sensing device as it is used to sign

Appln No. 09/575,171
Amdt. March 17, 2004
Response to Advisory action of February 19, 2004

4

the signature onto the surface.

15. (Original) A method according to claim 14, further including the step of generating movement data in the form of a locus of the sensing device in relation to the surface, the locus being determined by ascertaining relative displacement of the sensing device.

16. (Original) A method according to claim 15, wherein the relative displacement is obtained by doubly integrating the acceleration with respect to time.

17. (Previously presented) A method according to claim 15, wherein the acceleration measuring device includes one or more accelerometers configured to measure at least two orthogonal components of acceleration.

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18. (Previously presented) A method according to any one of claims 1 to 6, wherein position elements are disposed on the interface surface, the sensing device being configured to periodically sense position elements as it is used to draw onto the surface, the method including the step of generating the movement data by ascertaining relative displacement of the sensing device over time with respect to at least one of the position elements.

19. (Original) A method according to claim 18, wherein the position elements are disposed on the surface as a regular array of dots, lines or other formations.

20. (Original) A method according to claim 18, wherein the position elements are disposed on the surface stochastically.

21. (Original) A method according to any one of claims 1 to 6, wherein the movement data is generated by ascertaining relative rotation of one or more motion sensing elements rotatably mounted to the sensing device for contact with the surface while the sensing device is used to sign the signature thereon.

22. (Original) A method according to claim 21, wherein the motion sensing elements include one or more rollerballs mounted for rotation within a constraining housing disposed substantially within the sensing device.

Appln No. 09/575,171
Amdt. March 17, 2004
Response to Advisory action of February 19, 2004

5

23. (Original) A method according to claim 22, wherein components of rotation of the rollerball, due to movement of the sensing device when signing the signature onto the surface, are periodically measured.

24. (Original) A method according to claim 23, wherein the components of rotation of the rollerball due to movement of the sensing device by the user when signing the signature onto the surface are measured by means of:

rollers disposed within the constraining housing for rotation, the rollers being configured to be driven by contact with the rotating rollerball; or
optical sensing of rotation of the rollerball with respect to the constraining housing.

25. (Original) A method according to any one of claims 1 to 6, wherein the coded data includes at least one tag, each tag being indicative of the signature field.

26. (Original) A method according to claim 25, wherein the tags are also indicative of points within the signature field.

27. (Original) A method according to claim 26, wherein each of the tags includes:
first identity data defining a relative position of that tag; and
second identity data identifying the signature field.

28. (Original) A method according to claim 27, wherein the relative position is defined in relation to the signature field.

29. (Original) A method according to claim 27, wherein the relative position is defined in relation to a plurality of the other tags.

30. (Original) A method according to claim 27, wherein the relative position is defined in relation to the interface surface.

31. (Original) A method according to claim 27, wherein the first identity data identifies stored information defining the relative position, the stored information not being stored on the interface surface.

Appln No. 09/575,171

Amdt. March 17, 2004

Response to Advisory action of February 19, 2004

6

32. (Original) A method according to claim 31, wherein the first identity data and the second identity data together identify stored information defining the relative position.

33. (Currently amended) A system for enabling user interaction with computer software running in a computer system, the system including:

an interface surface displaying information relating to the computer software including a visible signature region corresponding to a signature field relating to the computer software, the interface surface having coded data disposed thereon both inside and outside the signature region, wherein all of the coded data is indicative of its own position relative to the interface surface and wherein the coded data located inside the signature region is further indicative of the signature field; and

a sensing device which, when placed in an operative position relative to the interface surface, senses at least some of the coded data and generates indicating data indicative of the signature field using at least some of the coded data, and generates movement data indicative of the sensing device's movement;

the computer system being configured to:

- (a) receive the indicating data from the sensing device;
- (b) receive the movement data from the sensing device;
- (c) identify the signature field on the basis of the indicating data;
- (d) generate, in the computer system and using a signature key of the user that is a private key, a digital signature of digital content related to the computer software; and
- ([[d]]e) operate the computer software at least partly in reliance on the movement data, and in accordance with instructions associated with the signature field.

34. (Original) A system according to claim 33, wherein the computer system is configured to verify that the movement data represents a handwritten signature of the user.

35. (Original) A system according to claim 34, wherein the computer system is configured to identify the user.

36. (Original) A system according to claim 35, wherein the computer system is configured to identify the user by using the movement data.

37. (Original) A system according to claim 35, wherein the computer system is

Appln No. 09/575,171
Amdt. March 17, 2004
Response to Advisory action of February 19, 2004

7

configured to receive data indicative of the identity of the user.

38. (Original) A system according to claim 35, wherein the computer system is configured to receive data from storage means of the sensing device, the data being indicative of the identity of the user.

39. (Cancelled)

40. (Currently amended) A system according to claim ~~[[39]]~~33, wherein the computer system is configured to generate a fixed length hash based on the digital content and to encrypt the hash in accordance with the signature key after the signature has been verified, thereby to generate the digital signature.

41. (Currently amended) A system according to claim ~~[[39]]~~33, wherein the digital content is provided by the user.

42. (Original) A system according to claim 41, wherein the digital content is based on data input by the user via the sensing device and interface surface.

43. (Currently amended) A system according to claim ~~[[39]]~~33, wherein the computer system is configured to associate the digital signature with the signature field.

44. (Original) A system according to any one of claims 33 to 38, wherein the computer system is configured to send data to the computer software indicative of at least the signature field.

45. (Original) A system according to any one of claims 33 to 38, wherein the signature field is associated with a visible signature zone defined on the interface surface.

46. (Original) A system according to any one of claims 33 to 38, wherein the sensing device includes at least one acceleration measuring device for measuring acceleration of the sensing device as it is used to sign the signature onto the surface, the movement data being generated by periodically sampling the acceleration of the sensing device as it is used to sign the signature onto the surface.

Appln No. 09/575,171
Amdt. March 17, 2004
Response to Advisory action of February 19, 2004

8

47. (Previously presented) A system according to claim 45, further including the step of generating movement data in the form of a locus of the sensing device in relation to the surface, the locus being determined by ascertaining relative displacement of the sensing device.

48. (Original) A method according to claim 47, wherein the relative displacement is obtained by doubly integrating the acceleration with respect to time.

49. (Original) A system according to claim 47, wherein the acceleration measuring device includes one or more accelerometers configured to measure at least two orthogonal components of acceleration.

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50. (Previously presented) A system according to any one of claims 33 to 38, wherein position elements are disposed on the interface surface, the sensing device being configured to periodically sense position elements as it is used to sign the signature onto the surface, the movement data being generated by ascertaining relative displacement of the sensing device over time with respect to at least one of the position elements.

51. (Original) A system according to claim 50, wherein the position elements are disposed on the surface as a regular array of dots, lines or other formations.

52. (Original) A system according to claim 50, wherein the position elements are disposed on the surface stochastically.

53. (Original) A system according to any one of claims 33 to 38, wherein the movement data is generated by ascertaining relative movement of one or more motion sensing elements rotatably mounted to the sensing device for contact with the surface while the sensing device is used to sign the signature thereon.

54. (Original) A system according to claim 53, wherein the motion sensing elements include one or more rollerballs mounted for rotation within a constraining housing disposed substantially within the sensing device.

Appln No. 09/575,171

Amdt. March 17, 2004

Response to Advisory action of February 19, 2004

9

55. (Original) A system according to claim 54, wherein components of rotation of the rollerball, due to movement of the sensing device when signing the signature onto the surface, are periodically measured.
56. (Original) A system according to claim 55, wherein the components of rotation of the rollerball due to movement of the sensing device by the user when signing the signature onto the surface are measured by means of:
- rollers disposed within the constraining housing for rotation, the rollers being configured to be driven by contact with the rotating rollerball; or
- optical sensing of rotation of the rollerball with respect to the constraining housing.
57. (Original) A system according to any one of claims 33 to 38, wherein the coded data includes at least one tag, each tag being indicative of the signature field.
58. (Original) A system according to claim 57, wherein the tags are also indicative of points within the signature field.
59. (Original) A system according to claim 58, wherein each of the tags includes:
- first identity data defining a relative position of that tag; and
- second identity data identifying the signature field.
60. (Original) A system according to claim 59, wherein the relative position is defined in relation to the signature field.
61. (Original) A system according to claim 59, wherein the relative position is defined in relation to a plurality of the other tags.
62. (Original) A system according to claim 59, wherein the relative position is defined in relation to the interface surface.
63. (Original) A system according to claim 59, wherein the first identity data identifies stored information defining the relative position, the stored information not being stored on the interface surface.

Appln No. 09/575,171

Amdt. March 17, 2004

Response to Advisory action of February 19, 2004

10

64. (Original) A system according to claim 61, wherein the first identity data and the second identity data together identify stored information defining the relative position.

65. (Currently amended) A system for enabling user interaction with computer software running in a computer system, the system including:

an interface surface displaying information relating to the computer software including a visible signature region corresponding to a signature field relating to the computer software, the interface surface having coded data disposed thereon both inside and outside the signature region, wherein all of the coded data is indicative of its own position relative to the interface surface and wherein the coded data located inside the signature region is further indicative of the signature field;

the computer system being configured to:

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- (a) receive indicating data from a sensing device, the indicating data being indicative of the signature field, wherein the sensing device, when placed in an operative position relative to the interface surface, senses at least some of the coded data and generates the indicating data using at least some of the coded data, and generates movement data indicative of the sensing device's movement relative to the interface surface;
 - (b) receive the movement data from the sensing device;
 - (c) identify the signature field on the basis of the indicating data;
 - (d) generate, in the computer system and using a signature key of the user that is a private key, a digital signature of digital content related to the computer software; and
 - (((d))e) operate the computer software at least partly in reliance on the movement data, and in accordance with instructions associated with the signature field.

66. (Original) A system according to claim 65, wherein the computer system is configured to verify that the movement data represents a handwritten signature of the user.

67. (Original) A system according to claim 66, wherein the computer system is configured to identify the user by using the movement data.

68. (Original) A system according to claim 65, wherein the computer system is configured to receive data indicative of the identity of the user.

69. (Original) A system according to claim 65, wherein the computer system is

Appln No. 09/575,171
Amdt. March 17, 2004
Response to Advisory action of February 19, 2004

11

configured to receive data from storage means of the sensing device, the data being indicative of the identity of the user.

70. (Cancelled)

71. (Currently amended) A system according to claim ~~[[70]]~~65, wherein the computer system is configured to associate the digital signature with the signature field.

72. (Original) A system according to any one of claims 65 to 67, wherein the signature field is associated with a visible signature zone defined on the interface surface.

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73. (Original) A system according to any one of claims 65 to 67, wherein the sensing device includes at least one acceleration measuring device for measuring acceleration of the sensing device as it is used to sign the signature onto the surface, the movement data being generated by periodically sampling the acceleration of the sensing device as it is used to sign the signature onto the surface.

74. (Previously presented) A system according to claim 73, wherein a relative displacement of the sensing device is obtained by doubly integrating the acceleration with respect to time.

75. (Original) A system according to claim 73, wherein the acceleration measuring device includes one or more accelerometers configured to measure at least two orthogonal components of acceleration.

76. (Previously presented) A system according to any one of claims 65 to 67, wherein position elements are disposed on the interface surface, the sensing device being configured to periodically sense position elements as it is used to sign the signature onto the surface, the movement data being generated in the form of a locus of the sensing device in relation to the surface by ascertaining relative displacement of the sensing device with respect to at least one of the position elements.

77. (Original) A system according to any one of claims 65 to 67, wherein the movement data is generated by ascertaining relative movement of one or more motion

Appln No. 09/575,171
Amdt. March 17, 2004
Response to Advisory action of February 19, 2004

12

sensing elements rotatably mounted to the sensing device for contact with the surface while the sensing device is used to sign the signature thereon.

78. (Original) A system according to any one of claims 65 to 67, wherein the coded data includes at least one tag, each tag being indicative of the signature field.

79. (Original) A system according to claim 75, wherein the tags are also indicative of points within the signature field.

80. (Original) A system according to claim 75, wherein each of the tags includes:
first identity data defining a relative position of that tag; and
second identity data identifying the signature field.

81. (Original) A system according to claim 80, wherein the relative position is defined in relation to the signature field, a plurality of the other tags, or the interface surface.